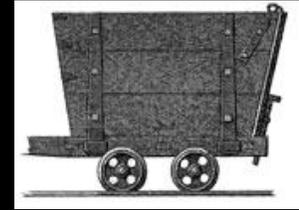
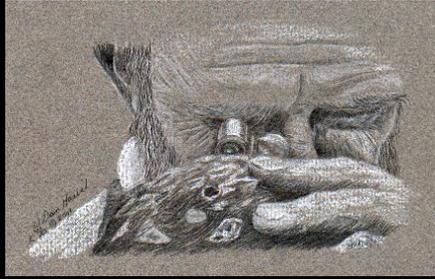
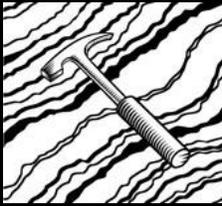


Gem Hunter – The Prospector's Newsletter



Vol 2, No 10, Oct. 2010

Newsletter from the GemHunter

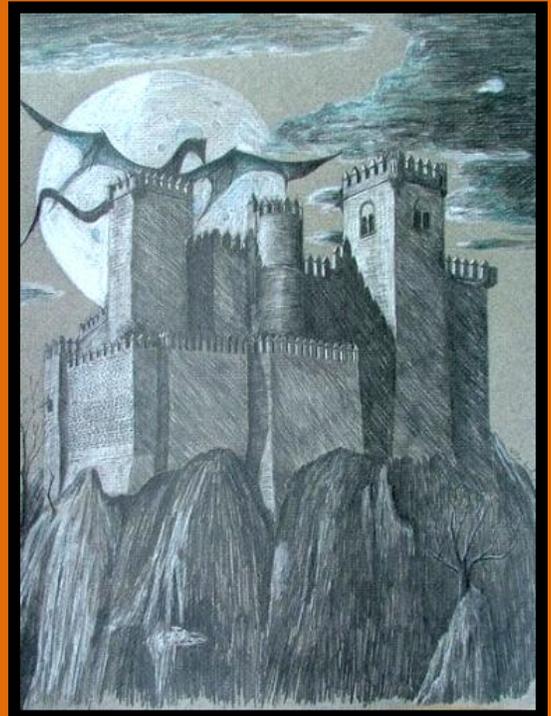
ARIZONA – GOLD GEOLOGY & PROSPECTING (Part 2) – COMPARISONS TO WYOMING

In 2006, I packed up to leave God's country for Arizona. God's country you ask? Why it's Wyoming! However, my wife and others who have not lived in Wyoming for most of their lives refer to the least populated state in the US with a four-letter word giving the erroneous impression that it belongs to Lucifer. Non-stop hurricane-force winds, cold, and weather suitable for an Eskimo drive some people crazy: but others, thicken their blood, enjoy a little frost bite now and then, and come to love the cowboy state. If you don't believe me, ask all ten of us.

There are many interesting things about Wyoming besides Yellowstone, the Grand Tetons and rodeo. For instance, no matter what direction you ride a bike it is always in a head wind. If you play tennis outside and orient yourself properly, you won't need a partner. In the fall, spring, winter and most of the summer, you only need a snow shovel and putter to play golf with the other one or two golf fanatics. So there are many benefits.

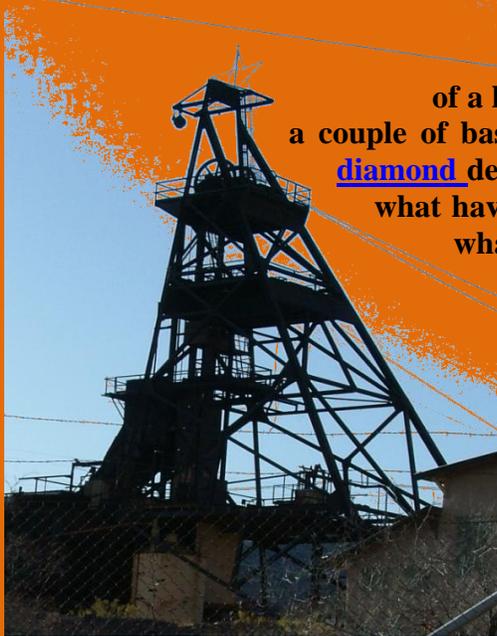
So where did the name Wyoming come from? It's rumored the Delaware Indians named 'Wyoming' in reference to mountains and valleys. But the Delaware Indians never made it to Wyoming; and if they did, they would have been blown all the way to Delaware, so I suspect this may just be legend. My uncle discovered in 1998 that our genealogy includes at least one Indian, thus since I'm 1/30th American Indian, I'm an authority on Indian language. And I interpret *Wyoming* to mean 'big wind' in reference to the 364 days of wind each year, or to 'blowhard politicians'.

*Happy Halloween from the GemHunter. All the best on a
[Late October Night](#)*



The GemHunter Newsletter
W. Dan Hausel (GemHunter@live.com)
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I loved working in Wyoming. It was mostly unexplored for metals and gemstones when I arrived in 1977. Over three decades, myself and others found hundreds of precious metal anomalies, colored gemstones and diamonds along with some base metals. I even mapped some of the rarest, oldest and youngest volcanic rocks in North America. Prior to 1977, few of the mountain ranges had been mapped, and gemstones were unknown in the state other than jade. It was a geologist's dream! While most other geologists in the WGS (Wyoming Geological Survey) meditated (at least that's what we think they were doing), I spent years mapping these old districts. Today, Wyoming is known to have the most diversified assemblage of gemstones in the US, and it will



likely have its first lode gold mine in nearly a century before the end of the next decade! And if the State had its act together, Wyoming could proudly display the opening of a handful of precious metal mines, a few color gemstone mines, a couple of base metal mines, and potentially identify some of the larger diamond deposits in North America. But they don't seem to understand what having their act together means. As an example, try to imagine what 2.7 trillion carats of a rare gemstone would look like that sold for \$15 to \$150/carat. Get the idea – well this point was too difficult for the state to grasp.

I worked in this geologist's *Garden of Eden* until 2005-06. It was the democratic caucus that made it clear I was finding too much for their green blood. After several discoveries including a few of the largest colored gemstone deposits in the world, they had enough. How dare a government employee do his job! It was the same thing happening over and over again for the past 30 years. Whenever any gem or metal deposit of significance was

discovered, it was buried by Federal or State government withdrawals – wilderness, primitive, rare II, roadless (didn't matter that dozens of roads ran through roadless areas). It was so ridiculous that the Bureau of Land Management actually wanted to withdraw a previously undocumented opal discovery investigated by the WGS in 2003, before they even knew where it was located. They were concerned about protecting a yellow flower that apparently was not indigenous to the region according to one scientist at the UW Department of Agriculture. Wyoming has \$billions in metals locked up in these withdrawn areas by both the Federal and State Government who seem to represent their own interest and could care less about the public who they are suppose to be working for.

I left the WGS after it had reached a new low. Possibly the only other time the integrity of this agency was so low, was when Territorial Geologist, Samuel Aughey, was purportedly caught red handed salting samples from the Silver Crown district near Cheyenne. But by 2006, the Wyoming Geological Survey's integrity had reached a low that even surpassed this 1886 scandal, and like so many scientific agencies and universities recently influenced by democratic caucuses; science was being manipulated to fit political agenda and desired results. But I was lucky - I had just enough time to retire and Aussie, Canadian and US diamond, gold, and base metal companies were knocking on my door. So I answered.

My wife couldn't take another day in Wyoming, particularly after we had lost sight of the backyard in November. We hadn't seen it for months and we were worried about the expanding glacier outside. Where was Al Gore when you needed him? So, Sharon grabbed my ear lobe and off we went to Gilbert, Arizona, one of the hottest places on earth. But now that I've been in Arizona for four years, my blood is thinning - I can actually walk outside for a few minutes each summer. Arizona is as hot as ... well you know. In Gilbert, you can cook an egg on the sidewalk any day of the year, we have Sheriff Joe, and there are many old mining districts to explore (particularly if you are heavily armed).

So we began investigating mining districts within the Basin and Range province in Arizona and nearby states. Just like I anticipated, there are overlooked gold and copper deposits. These will require reconnaissance prospecting, detailed geological mapping, sampling, and drilling, but if properly explored or prospected, a few of these could potentially be mined.



Gold- and silver-bearing vein sample from the Kirwin district, Wyoming. The surrounding country rock is bleached white due to the intense phyllic alteration (addition of quartz and potassium to the original host rock).

Arizona has always been a very important source for copper and other base metals and has produced significant amounts of gold and silver. In total, more than 16 million ounces of gold have been mined from

Arizona's soil. Most of the easy deposits have been found and there are likely other deposits hidden under our feet. Some anomalies suggest the presence of hidden gold and copper deposits including giant, copper-gold porphyries. We just need the time to examine all of these.

For those unfamiliar with [porphyries](#), these are thought to represent root zones of old volcanoes or magma chambers. Rocks associated with porphyries include multiple granitic stocks (more specifically granodiorite, diorite, quartz monzonite, rhyolite, andesite); some of which have porphyritic texture. A porphyritic rock is simply an igneous rock that has larger crystals (such as feldspar and quartz) dispersed throughout a finer grained rock matrix. When mineralized, porphyries may have disseminated sulfide blebs in rock matrix and in fractures, veinlets and veins. When such mineralized rocks intrude reactive rocks such as limestone, the intruded rock is replaced by massive sulfides known as replacement deposits or skarns. Mineralized porphyries are also accompanied by high-grade veins, veinlet networks called 'stockworks' and mineralized breccia pipes. Thus when searching for porphyry deposits, one needs to become familiar with porphyritic texture, breccia pipes, mineral zonation and wall rock alteration.

Veins surrounding mineralized porphyry will likely contain copper, gold, zinc, silver and lead. Wallrock alteration is likely to leave large areas of the normally white to pinkish igneous rocks being replaced by greenish minerals (chlorite, epidote, calcite, etc).

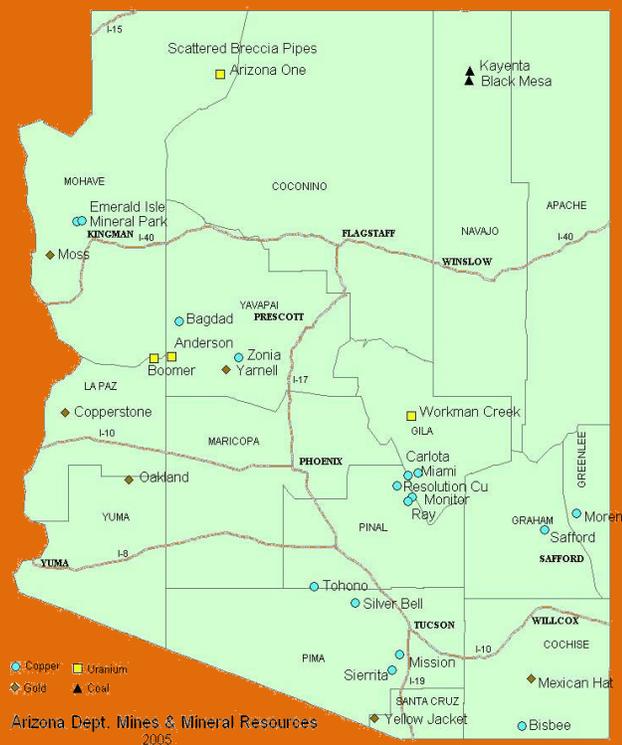
Veins within and surrounding porphyries and replacement deposits in limestones provide good targets for prospectors as many have high gold and silver values. For example, a group of veins explored near the Kirwin porphyry by AMAX in the 1970s-80s in Wyoming, yielded channel samples with >50 ounces per ton (opt) silver, and a few that assayed >100 opt silver (Ora Rostad, personal communication, 1980). What is amazing about these is they were taken at the mine face (the last place that was mined) indicating the miners walked away from economic silver and gold veins (Hausel, 1982, 1997)! But the Federal government followed up each discovery in the Absaroka Mountains with withdrawals from mineral exploration.

Many veins and dikes associated with mineralized porphyries radiate outward from the center of the complex. Even though porphyry deposits are considered low-grade and primarily mined by open pit, they often enclose a few \$billion in metals including copper, gold, silver, lead, zinc, molybdenum and some gemstones. Porphyry deposits have distinct rock types, extensive wallrock alteration and mineralization which help the geologist and prospector to identify these. If you would like to see what several billion dollars look like, visit the Bingham copper mine west of Salt Lake City (Chenworth, 2010). This is a giant porphyry deposit mined for more than 100 years and is the largest open pit mine on earth.

In Arizona, early prospecting began with Spanish and Mexican prospectors who searched for silver. However, they didn't find what they were looking for and had to settle for gold and copper. Gold was discovered in 1774 in the Quijotoa Mountains (60 miles west of present day Tucson) by a Spanish priest. The gold occurred in gravel and in nearby veins associated with hematitic breccias.

Following this discovery, gold was found in several districts over the next two centuries that are described by Wilson and others (1969) and Wilson (1981).

Mines and minerals map of Arizona, Arizona Department of Mines and Mineral Resources, 2005.



Many gold placers in Arizona are found in fanglomerates which lie on and in pediment surfaces high and dry at the base of mountains or hills. Placer gold may also be found in adjacent gulches down-slope from these. Similar to Australia, active stream placers are rare in Arizona because of the lack of perennial streams. Gold in fanglomerates is typically found near a lode source, and it is not uncommon for the lode to be buried under a few feet of eluvium in a fanglomerate. This needs to be kept in mind by prospectors who search Arizona for nuggets in these fanglomerates.

One of the few active stream placers is known as the Lynx placers near the southern edge of the town of Prescott 70 miles north-northwest of Phoenix in western Arizona where more than 108,000 ounces of gold were recovered as flakes and nuggets up to 4 ounces. Another wet placer was discovered near the confluence of the Gila with the Colorado Rivers in southwestern Arizona, by has apparently been mostly mined out after more than a century of activity.

In addition to copper and gold, some molybdenum, lead, zinc, silver, turquoise and other metals and gemstones have been mined in Arizona. Base and precious metals are currently mined at Morenci, Safford, Ray, Carlota, Miami, Monitor, Bagdad, Sierrita, Mission, Silver Bell, Pinto Valley, Mineral Park and Johnson Camp.

The majority of mines and prospects were developed on copper porphyry and massive sulfide deposits scattered along a distinct northwesterly trend within the Basin and Range province across the lower half of the state south of the Mogollon rim (which marks the southern edge of the Colorado Plateau) running through Cochese County at the southeast, across the state at a 30° angle to the northwest in Mohave County. Many gold anomalies within the Basin and Range province and Transition zone between these two provinces suggest a presence of undiscovered gold and copper deposits.

Over the past several years, Arizona produced \$6 to \$8 billion in mineral resources annually, much of which is recovered from porphyry copper deposits where precious metals were recovered as by-products of copper mining. But in addition to these, Arizona hosts several dry placers that are poorly explored for lode deposits, auriferous iron formation, breccia pipes and low-grade disseminated gold deposits. Any one of these could lead to a primary gold mine.

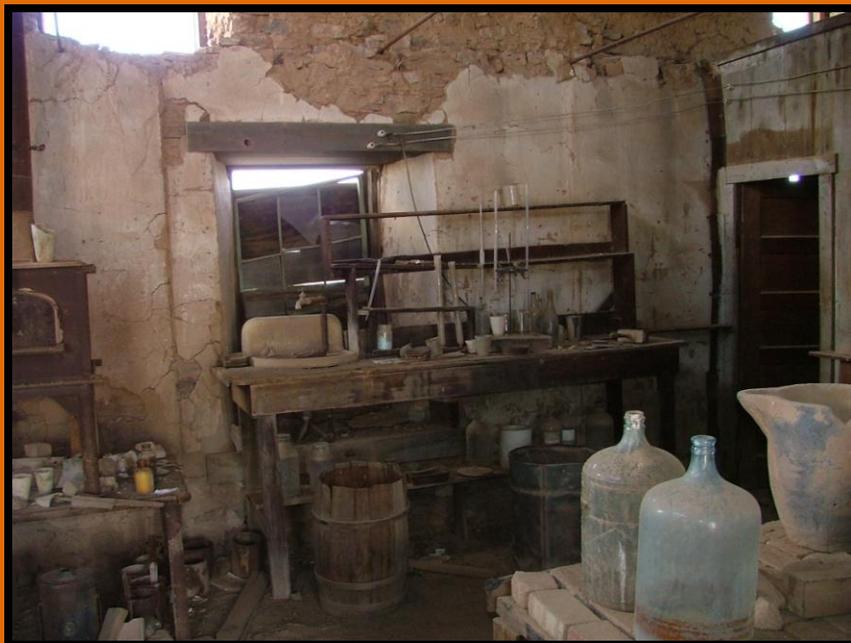
Mineralized breccia with angular tawny-colored rock fragments cemented by copper-stained quartz. This mineralized sample is typical of breccia pipes associated with porphyries. Note that there are prismatic quartz crystals in the open spaces.



Conclusions.

Arizona has several important mines and known mineral deposits with potential for discovery of additional gold and copper resources. Areas of notable interest for gold in Eastern Arizona include Gleeson, Oro Blanco, Greaterville and Copper Creek. Western Arizona has several known gold deposits that include lode, placer and dry placers that suggest several gold deposits likely remain hidden and undiscovered. Some notable deposits in western Arizona include the Vulture mine and Rich Hill within the Wickenburg district, the Katherine and Oatman properties in the San Francisco district, prospects in the Wallapai district, gold in Lost Basin district, and gold in the La Paz district within the Dome

Rock Mountains, Plomosa Mountains and La Posa plain between these two mountain ranges. These will be discussed in follow-up articles on Arizona.



The Arizona Department of Mines and Mineral Resources reported \$7.6 billion in minerals were mined in 2007. But Arizona provides its own kind of challenge. Not only is the summer heat and lack of water a concern, but the danger of working in the field south of Phoenix must be weighed. There are companies that will not explore near the Mexican border and others that require employees to be armed and work in groups because of possibilities of running into heavily armed foreign drug runners with automatic weapons – a problem

that worsens. In Wyoming, circumstances were different. One had to be concerned with getting caught in a spring blizzard or worse yet, dealing with government bureaucrats over-regulating everything from rock collecting to walking on dirt.

Only Mexico has a higher kidnapping rate than Phoenix. One website reports 83% of all warrants issued for murder in Phoenix and 95% of warrants issued in Los Angeles were for illegal immigrants. In a book on the Mexican Sierra Madre, Grant (2008) reported that the largest portion of Mexico's economy is based on selling and distribution of illegal drugs. The next major component is money sent by illegals in the US to families south of the border – most of which is untaxed.

There are many places in Arizona that are worthy of exploration and it is a shame that one has to be so cautious near the border. For example, the US government closed 3,500 acres of the Buenos Aires National Wildlife Refuge to US citizens because of "... *safety concerns fueled by drug and human smuggling along the Arizona-Mexican border...*" according to an article by FoxNews.com entitled *US Parkland Bordering Mexico, Shut Since 2006, Remains Off-Limits As Violence Escalates, June 17th, 2010.*

Some references used in compilation of this article

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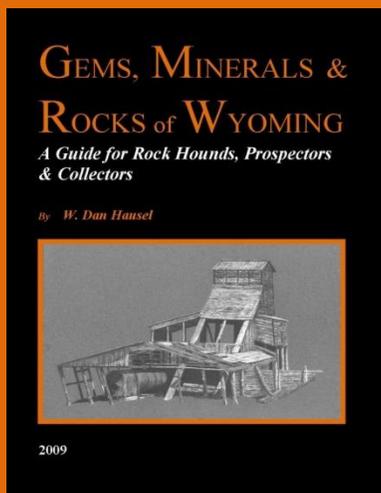
METAL PRICES (10/14/2010)

Gold - \$1,383/oz Silver - \$24.72/oz Platinum - \$1,713/oz Palladium - \$600/oz
Copper - \$3.79/lb Nickel - \$11.05/lb Zinc - \$1.08/lb Rhodium - \$2,240/oz
Lead - \$1.08/lb

BOOKS

GEMS, MINERALS & ROCKS of WYOMING – A Guide for Rock Hounds, Prospectors and Collectors [Now available](#) from [Amazon](#): or order it from your local bookseller.

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